



**Department of  
Environmental Protection  
Bureau of Land & Water Quality   November 2004  
O&M Newsletter**

**A monthly newsletter for wastewater discharge licensees, treatment facility operators, and associated persons**

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## **Financial Management Article 3 – Budgeting**

A budget is a tool for you to use to make decisions about income and expenses at your facility. The word “budget” comes from the French “little bag”. In the British parliament, the chancellor of the exchequer (England’s equivalent of the Secretary of the Treasury) came to parliament to ask for money to fund various government functions, he would take his financial documents out of a “little bag” and so, we get the word budget. Although we usually don’t carry financial papers around in a little bag anymore, the concepts are the same... planning for future income and expenses, allotting funds for various purposes, tracking actual income and expenditures, and

comparing those against the allotments are all part of the budgeting process.

A good budget usually has several major categories. These usually include:

- operating expenses
- emergency operating reserve
- debt service payments
- debt service reserves
- reserves for asset replacement

Let’s look at each of these categories and see what they include.

### **Operating Expenses**

These are the expenses you incur from daily operation of the facility. They include things like:

- personnel
- benefits
- utilities
- sludge disposal
- training
- materials & supplies
- vehicle expense
- insurance
- advertising
- chemicals

You should review your actual expenses for these items over the last three to five years to determine how much you should budget in each area. You should look forward to the upcoming year and ask yourself some questions like:

- Will you increase or decrease staff?
- Will new permit requirements require more sampling and analysis?
- Will you need new or different materials and supplies?
- Will administrative costs increase?
- Will your operators require training and recertification?
- Will the number of customers grow or get smaller?

Although previous expenses can help you project your budget for the future, don't rely exclusively on that information when doing your budget. If you know fuel oil costs or electric rates are increasing, you should be sure to adjust the budget accordingly. Similarly, if you've stopped using a chemical, your budget should be adjusted. If your expenditures in a particular area over the last three years show a trend of increasing or decreasing, this should also be factored into your budget.

If you are a "one person shop", you probably have to do all the budget work yourself. If you're in a larger facility, it's usually good to involve other people in the budgeting process. It helps you get the best possible information for the budget and it helps train others in the budgeting process so that they might one day take over developing the budget for the facility. Budgets should always be developed with the help and advice of the operators. Budgets put together by administrators or trustees without help from the "line" staff are usually less reliable than those made with the help of the people who are actually doing the day-to-day operation.

### **Emergency Operating Reserve**

You should always budget some funds for emergencies. If you don't have good historical information about past

"emergency" operation costs, you can use a figure of 10% of your regular operating budget as an estimate. As equipment ages, it may require more frequent maintenance. Thus, in older plants, you might want to set aside 15% of the regular operating budget for the emergency operating reserve.

### **Debt Service**

Virtually all publicly operated wastewater treatment facilities have some debt that must be paid off each year. The portion of the debt that must be paid each year includes a portion of the principal and the interest charged by the lender. Sometimes, debt payments are structured like your home mortgage, with a fixed payment. As the debt is retired, the fraction of the payment that represents payment on principal goes up and the fraction that represents debt decreases. Some loans are structured with a fixed principal payment and a variable interest payment based on the outstanding principal. You need to determine what type of loan you have to budget correctly. Also, if you are planning to borrow money for renovations or to meet ongoing expenses before your bills go out, you should include this in your budget.

### **Debt Service Reserves**

Most lenders require you to maintain a certain level of reserve for your debt payments. Your loan agreement(s) will spell out how much reserve must be maintained. Prompt payment of loans and maintaining a good reserve helps make sure that you can borrow money in the future at more favorable rates. A little later in this article we will discuss the concept of the Debt Service Coverage Ratio and how you can use this as a gauge of your financial health.

## **Asset Replacement Reserve**

One thing that is a given in the wastewater field is that mechanical systems, and even tanks and pipes, wear out over time. If you have more revenue that is necessary to cover the operating expended and debt service, you should consider establishing an asset replacement reserve account. Any money put into this account will earn interest and will be available to defray the costs of asset replacement when that is necessary. The money is also available as an emergency fund, should your operating reserves not be adequate in a given year. You can save a significant amount of money by creating an Asset Replacement Reserve rather than borrowing money when equipment must be replaced. However, it is not always possible to collect enough revenue from your users to pay your ongoing operating costs, service your debt and build an Asset Replacement Reserve.

## **Operating Ratio and Debt Service Coverage Ratio**

The US EPA uses two fairly simple ratios to measure the financial health of wastewater utilities. The first is the Operating Ratio (OR). This compares the operations and maintenance (O&M) expenses against the total operating revenue of the facility. EPA says that an OR of more than 1.2 is an indication that the system is in good financial health. An OR of less than one (1.0) means the system is in serious trouble. They will not be able to pay their normal O&M expenses from the revenues they receive. Money from other sources (grants from government agencies, loans or sale of assets) would be necessary to meet the system's financial obligations.

The Debt Service Coverage Ratio (DSCR) is the ratio of the difference between the annual gross revenues (AGR) of the system less the operating and maintenance (O&M) expenses divided by the annual principal and interest charges. It is a measure of the system's ability to pay back outstanding loans. EPA considers a DSCR of 1.5 or greater as very good, A DSCR between 1.0 and 1.5 is adequate, but if the DSCR drops below 1.0 there are inadequate revenues to service the outstanding debt.

When you have put your expense budget together, you need to look at the income side of the ledger. Most of your income will probably come from user fees, the amount each of your users pays for the services you give them. You may also get some money from miscellaneous sources like hook-up or service fees, interest and dividends from investments and loans or grants from other funding sources. If your facility is part of the municipal government, rather than a separate district, you may also receive some appropriation from your city or town from the general revenue budget.

If you're lucky (or, better, if you planned well) you're projected income will equal or be more than your projected expenses. If so, you can put the surplus into your emergency operating reserve or your debt service reserve. If there isn't enough income to fund all of your expenses, you have to make some tough decisions about what won't get money. Usually, the reserve accounts are the first to "take a hit". You can usually forego putting money into a debt service reserve account in a given year, but don't reduce your emergency operating reserve too low.

If you trim everything you can from the expense side and there still isn't enough to pay the bills, you probably have to raise rates. The next article in this series will talk about rate structure and setting rates that are fair for your users and give you enough money to run your system.

## Certification News

The Fall 2004 wastewater operator certification exam was given on **November 10, 2004** in the usual locations. If you took the exam the results should be back in 4 to 6 weeks. **Please** don't call Leslie Rucker or me to ask what score you got on the exam. We turn the test results around as quickly as we can once we receive the scores back from ABC. It's usually no more than a day after we receive them.

The Spring, 2005 exam will be given in the usual places on May 11, 2005.

## For Practice

1. The term mg (milligrams) in the expression mg/L is a measure of
  - a. Mass
  - b. Length
  - c. Volume
  - d. Area
2. The term *slaking* refers to
  - a. Adding acid to a base
  - b. Adding quicklime to water.
  - c. Adding acid to water.
  - d. Adding water to salt.

3. If an air relief valve is needed in a force main, it should be installed
  - a. At the lowest point in the force main.
  - b. Just after the pump.
  - c. At the high point in the force main
  - d. Anywhere, it doesn't mater.
4. How many kilowatts of electricity must be available to drive a pump that moves 250 gallons per minute against a head of 30 feet if the combination of the pump and motor are 60% efficient?
  - a. 0.75 kW
  - b. 1.0 kW
  - c. 1.5 kW
  - d. 2.37 kW

## Approved Training

November 16, 2004 in Brewer ME - Total Maximum Daily Load: *Preparing For the Future* – Sponsored by NWWTA - 761-2991 – Approved for 4 hours  
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Nov 17, 2004 in North Vassalboro ME - Instrumentation Measurement & Control w/ Introduction to SCADA - Sponsored by JETCC – 253-8020 – Approved for 6 hours  
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November 18, 2004 in Portland ME - Lock-Out Tag-Out w/ Confined Space Entry Review SCADA - Sponsored by JETCC – 253-8020 – Approved for 6 hours  
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November 18, 2004 in Augusta, ME - Collection & Distribution Systems Blueprint Reading - Sponsored by NWWTA - 761-2991 – Approved for 4 hours  
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November 30-December 1, 2004 in Freeport ME – MRWA Annual Conference – Sponsored by MRWA – 729-6569 - approved for various hours depending on the class  
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Dec 2, 2004 in Bangor ME - Surviving your Lab Inspection (EPA, DEP Safety) - Sponsored by JETCC – 253-8020 – Approved for 6 hours

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December 2, 2004 in Topsham, ME - Preparing For NPDES Lab Inspection & How To Write Lab SOPs- Sponsored by NWWTA - 761-2991 – Approved for 4 hours

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December 7, 2004 in Brewer ME Beach - WORKPLACE SAFETY SERIES #2: Ladder Safety, Fall Protection, Confined Space Retrieval & Chainsaw Safety– Sponsored by NWWTA - 761-2991 – Approved for 4 hours

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December 7, 2004 in TBA Basic Pipe Installation – Sponsored by MRWA – 729-6569 – Approved for 4 hours

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December 8, 2004 in TBA Basic Pipe Installation – Sponsored by MRWA – 729-6569 – Approved for 4 hours

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8, 2004 in Portland ME - Use of polymers in the WWTF (½ day) - Sponsored by JETCC – 253-8020 – Approved for 3 hours

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December 8, 2004 in Portland ME - Coagulants & Flocculants in water applications (½ day) SCADA - Sponsored by JETCC – 253-8020 – Approved for 6 hours

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December 8, 2004 in Presque Isle, ME - Preparing For NPDES Lab Inspection & How To Write Lab SOPs – Sponsored by NWWTA - 761-2991 – Approved for 4 hours

December 9, 2004 in TBA Basic Pipe Installation – Sponsored by MRWA – 729-6569 – Approved for 4 hours

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Dec 14, 2004 in Augusta ME - Hands-on GIS 101 for infrastructure management SCADA - Sponsored by JETCC – 253-8020 – Approved for 6 hours

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December 14, 2004 in Caribou ME - Basic First Aid – Sponsored by MRWA – 729-6569 – Approved for 7 hours

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December 14, 2004 in Norway, ME - Preparing For NPDES Lab Inspection & How To Write Lab SOPs– Sponsored by NWWTA - 761-2991 – Approved for 4 hours

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December 15, 2004 in Bangor ME - Basic First Aid – Sponsored by MRWA – 729-6569 – Approved for 7 hours

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December 16, 2004 in Waterville ME - Basic First Aid – Sponsored by MRWA – 729-6569 – Approved for 7 hours

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December 14, 2004 in Norway ME - Basic First Aid – Sponsored by MRWA – 729-6569 – Approved for 7 hours

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December 14, 2004 in Scarborough ME - Basic First Aid – Sponsored by MRWA – 729-6569 – Approved for 7 hours

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### **Answers to *For Practice*:**

1. a. The term *mg* or *milligrams* is a measure of mass. 1 milligram equals 1/1000 grams.
2. b. Slaking is the process of adding quicklime to water to make a slurry.
3. c. Since air is less dense than water and will naturally rise to the highest point in a pipe; the relief valve should be placed at the highest point along the force main.
4. d. The horsepower required to lift the water is:  
$$(250 \text{ gpm} \times 30 \text{ ft}) / (3,960) = 1.9 \text{ HP}$$

The pump and motor system are 60% efficient, so the power necessary from the electric system is:  
$$(1.9 \text{ HP} \times .746 \text{ kW/HP}) / 0.60 = 2.4 \text{ kW}$$